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TEACHER USE OF INTERVENTIONS IN GENERAL EDUCATION SETTINGS: MEASUREMENT AND ANALYSIS OF THE INDEPENDENT VARIABLE

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This study examined the integrity with which 4 general education teachers implemented an intervention designed to improve the academic performance of elementary school students. Treatment integrity was measured daily using permanent products. The results showed that the 4 teachers markedly increased the integrity of the delivered treatment when they were provided with performance feedback. The results suggest that academic performance improved for the group of students as integrity improved.

DESCRIPTORS: performance feedback, teachers, treatment integrity, education, academic behavior, permanent products, treatment compliance

Accurate measurement of the independent and dependent variables is an important prerequisite to establishing experimentally the existence of a functional relationship. Although the dependent variable has been the focus of considerable attention, there has been less concern for the integrity of the independent variable (Gresham, Gansle, & Noell, 1993; Peterson, Homer, & Wonderlich, 1982). The accurate implementation of treatments is crucial to both clinical practice (e.g., consultation; Gresham, 1989) and applied research (e.g., demonstrating experimental control; Peterson et al., 1982). Developing procedures to promote treatment integrity in targeted environments will remove one of the barriers to the broader utilization of behavior analysis. This study examined the impact of performance feedback on the implementation of a reinforcement-based treatment by general education teachers.

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METHOD

Participants and Setting

Participants in this study were 4 female elementary school teachers and 4 male elementary school students instructed in regular education classrooms. Each of the teachers had sought assistance regarding the targeted student because of academic performance problems (inclusion criteria specified performance rather than skill deficits).

Response Definitions and Data Collection Procedures

Treatment integrity. The intervention was designed so that permanent products were produced when teachers completed treatment steps. For example, the score at the top of a graded paper was a product indicating that grading had been accomplished. As another example, reward slips (provided to children) were kept in a special box for tal-

lying and safekeeping. Rewards redeemed with reward slips were specified on the back, indicating that an exchange had occurred. Treatment integrity was calculated as a percentage based on the number of correct permanent products divided by the total number of treatment steps that were applicable for that day.

Student academic performance. Academic performance was defined as the percentage correct on daily targeted assignments.

Design

A nonconcurrent multiple baseline design was employed. Data pertaining to student academic performance prior to treatment were based on scores collected by the teacher prior to the initiation of activity for this study.

Training. On the first day of the intervention, a consultant attended class and assisted the teacher to ensure accuracy. Missed or incorrect steps were specified by the consultant and were included or corrected by the teacher.

Posttraining baseline. During this phase, the teacher implemented the intervention independently.

Performance feedback. During this phase, the consultant met with the teacher daily to provide data on the students' academic performance and the teachers' intervention implementation. The data were displayed on a simple computer-prepared graph that showed the student's percentage correct on daily assignments and the teacher's treatment integrity score. The consultant also specified missed treatment steps and suggested methods to enhance implementation.

Individual tutoring was added to the intervention for Ms. Timmer's student at the point indicated on the graph because of the student's poor academic performance.

Maintenance. This phase was identical to posttraining baseline. During the maintenance phase for Ms. Yargo, the data were collected weekly rather than daily.

Procedure

Treatment validation. To ensure that the child had a performance rather than a skill deficit and that the treatment was appropriate for the problem, a consultant evaluated the targeted student. The student was presented with a previously failed worksheet and was told that if he did his best, he would be allowed to select an item from a box of small prizes, a soft drink, or time with the consultant. If the student improved his performance by at least 50% over his in-class performance, the student was considered to have a potential performance deficit and became a candidate for this study. The rationale for the performance deficit hypothesis was that if the student exhibited the behavior in the presence of an apparent contingency for "hard work," but did not exhibit that level of performance in the regular environment, then the problem was more likely to be due to a performance deficit rather than a skill deficit.

An assessment of potential reinforcers was conducted following the initial meeting with the referring teacher. The consultant asked the teacher to review a standard list of 50 reinforcers (available from the first author) that might be used with elementary students. The teacher was asked to cross items off the list that would be unacceptable for use in her classroom. Next, the consultant asked the student to identify six items he would like to try to earn for doing good work at school. These six items constituted the menu of potential reinforcers that were then used during assessment and treatment.

The final phase of treatment validation consisted of an analogue test of the intervention before it was recommended to the teacher. In addition, this phase served to determine whether the menu of preferred rewards would function as reinforcers for the

targeted academic activity. During this phase, the consultant met with the student outside of the classroom. The student was presented with a previously failed worksheet and was informed of the performance required to select a reinforcer from the menu. If the student met the goal, he was allowed to select a reinforcer from his menu. If the student did not meet the criterion on the first trial, a second trial with a different worksheet was provided. If the student failed on both trials, he was given a consolation prize and was excluded from the study.

Consultation. After treatment validation was completed, the consultant met with the teacher, reviewed the assessment results, and recommended the intervention based on the performance deficit hypothesis. All of the teachers approved and agreed that the intervention was appropriate for the problem and consented to implement the intervention. The consultant provided the teacher with all of the materials needed to implement the intervention. After the consultant explained the intervention to the teacher, the teacher then explained the intervention to the student with the consultant's assistance. The consultant trained the teacher in the classroom the following day.

Data collection. At the end of each school day, a research assistant collected all permanent products from a designated storage box and scored them.

Integrity of Experimental Procedures

Integrity checks were performed by an independent observer using a checklist to ensure that consultants followed the experimental procedures (i.e., teacher training and performance feedback). For teacher training, the integrity of the experimental procedures averaged 98%. The integrity of the delivery of performance feedback was assessed in 29% of the sessions, with integrity averaging 96%.

RESULTS AND DISCUSSION

Figure 1 shows that all teachers exhibited 100% treatment integrity on the training day and a decreasing trend during posttraining baseline. Performance feedback resulted in marked increases in treatment integrity. Although academic performance varied considerably across students, mean condition scores for the group reflected improvements from pretreatment (M = 53%) to posttraining baseline (M = 71%), to performance feedback (M = 75%), to maintenance (M = 81%). Use of the intervention increased academic performance for all students, and enhanced treatment integrity resulted in additional increases in academic performance for 3 of the 4 students. The results show that none of the 4 teachers maintained treatment integrity above 80% for more than 2 days following training. The changes produced by performance feedback, however, persisted much longer (see Figure 1).

A strong point of the study is the use of the permanent-product data collection procedure to determine integrity. There are also two important noteworthy limitations. First, the demand characteristics of the consultant's presence during the performance feedback phase may have resulted in the teacher implementing the intervention with greater care than at times when the consultant was not present. Second, reactivity to being monitored and seeing the data on treatment integrity may have been sufficient to change the teachers' behavior independent of the performance feedback procedures.

Despite these limitations, the results extend the literature on treatment integrity, which has been mostly conceptual for years. The conceptual literature insists that the application of behavior analysis should be broadened to include the behavior of change agents as well as that of individuals whom the agents wish to change. This study shows one way that this can be done.

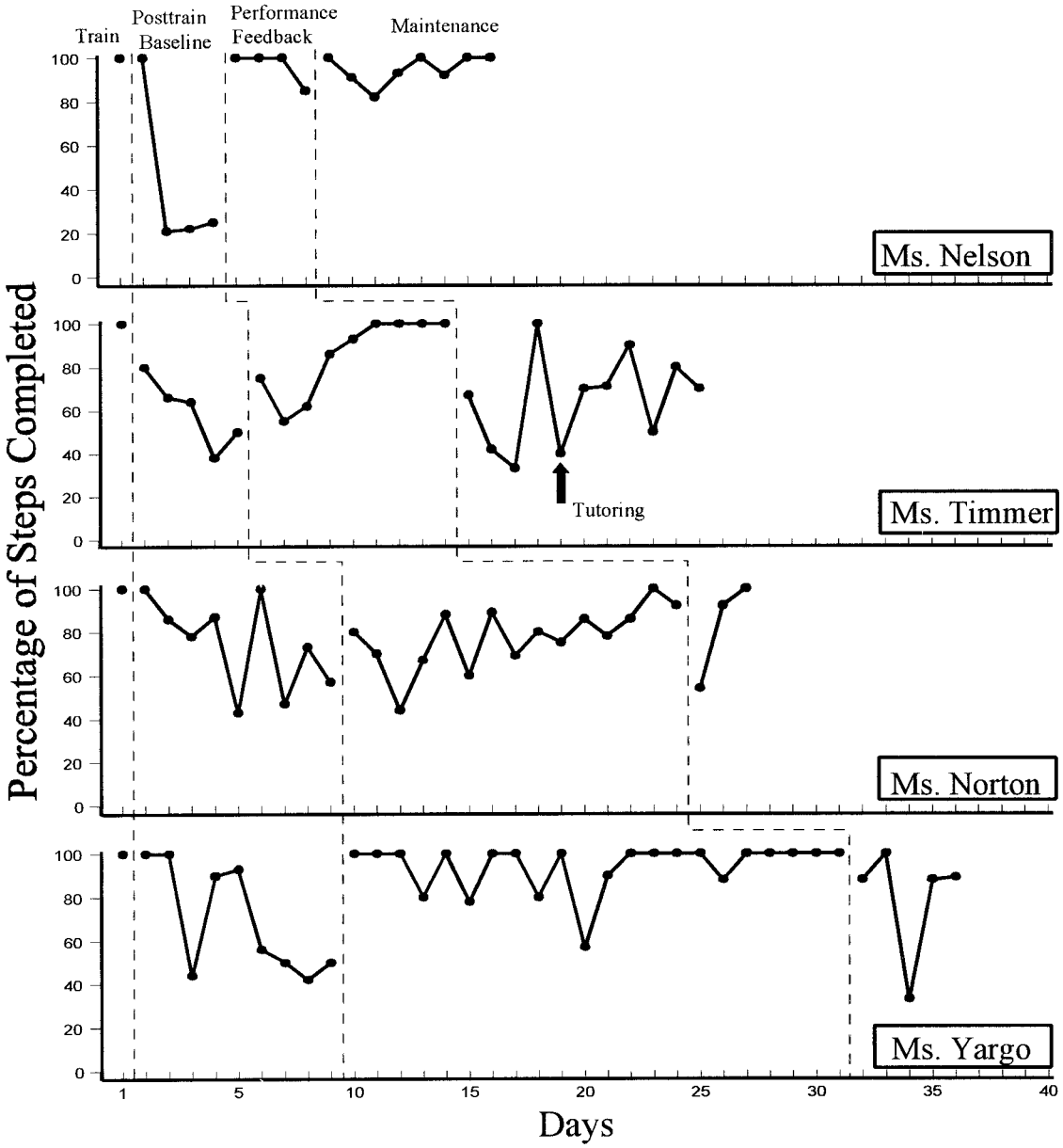

Figure 1. Treatment integrity across 4 teachers, each working with a different student.

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